A conspectus of *Polyscias* J.R.Forst. & G.Forst. (Araliaceae) in Queensland, Australia

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Summary

Bean, A.R. (2015). A conspectus of *Polyscias* J.R.Forst. & G.Forst. in Queensland, Australia. ***Austrobaileya* 9(3): 445–456**. The 12 indigenous species of *Polyscias* in Queensland are enumerated, and their nomenclature, distribution and habitat are discussed. Distribution maps and an identification key are provided. Specimen citations of *Polyscias zippeliana* (Miq.) Valeton from Australia are newly given. Lectotypes are selected for *Aralia nodosa* Blume, *Hedera australiana* F.Muell., *Nothopanax macgillivrayi* Seem., *Panax elegans* F.Muell., *Panax mollis* Benth., *Panax murrayi* F.Muell., *Panax zippeliana* Miq. and *Pentapanax willmottii* F.Muell.

Key Words: Araliaceae, *Polyscias*, *Polyscias zippeliana*, taxonomy, Queensland flora, lectotypes, nomenclature, identification key

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Introduction

Polyscias J.R.Forst. & G.Forst. is the second largest genus in Araliaceae, with 159 species (Lowry & Plunkett 2010), and is distributed from tropical Africa to the islands of the eastern Pacific Ocean. Over the last 150 years, *Polyscias* has sometimes been narrowly defined and sometimes broadly circumscribed. The current trend is a broadly defined *Polyscias*, exemplified by the molecular study of Plunkett & Lowry (2010), where *Polyscias* is used in a broad sense, encompassing several previously widely recognised genera including *Arthrophyllum* Blume, *Gastonia* Comm. ex Lam., *Tetraplasandra* A.Gray and *Reynoldsia* A.Gray. These genera have been shown to be polyphyletic or paraphyletic with respect to a narrowly defined *Polyscias*.

This paper presents a summary of the *Polyscias* species occurring in Queensland and adjacent areas, provides a key to their identification, and lectotypifies several names. 12 species of *Polyscias* are recognised here for Queensland, all are indigenous. Bostock & Holland (2014) listed 11 species as indigenous to Queensland. One species from that list, *P. scutellaria* (Burm.f.) Fosberg, is excluded from this account, because both existing records were found to be based on cultivated specimens; while two species are added – *P. spectabilis* (Harms) Lowry & G.M.Plunkett, which has recently been transferred from the genus *Gastonia*, and *P. zippeliana* (Miq.) Valeton, not previously recorded in Australian censuses or databases.

Materials and methods

This paper is based on the study of around 400 *Polyscias* specimens at BRI, and specimen images of types from BM, BR, FI, K, L, M and MEL. Any measurements given here have been made from dried herbarium specimens. Collection dates for historical New Guinean collections were determined using Steenis-Kruseman (2011). Distribution maps have been compiled using DIVA-GIS Version 7.5.0, using label data of specimens from BRI, and of the type specimen of *P. zippeliana* at L. Species treatments are arranged in alphabetical order.

Accepted for publication 23 July 2015

Common abbreviations used in the specimen citations are HS (homestead), LA (Logging Area), NP (National Park), SF/SFR (State Forest/State Forest Reserve) and TR (Timber Reserve).

Taxonomy

Polyscias J.R.Forst. & G.Forst., *Char. Gen. Pl.* 63 (1775).

Shrubs or trees; leaves alternate, imparipinnate or bipinnate (rarely tripinnate or unifoliolate); petiole with an expanded sheathing base; leaflets in pairs, margins entire, crenate or dentate. Inflorescences terminal, paniculate; flowers in umbels or less commonly in racemes; pedicels often articulated below the ovary. Ovary inferior. Calyx rudimentary, often comprising 5 small teeth. Petals 4-5(-8), valvate. Stamens equal in number to petals. Fruit a spherical or laterally flattened drupe, crowned by persistent styles.

1. Polyscias australiana (F.Muell.) Philipson, *Blumea* 24: 171 (1971); *Hedera australiana* F.Muell., *Fragm.* 4: 120 (1864); *Irvingia australiana* (F.Muell.) F.Muell., *Fragm.* 5: 18 (1865); *Kissodendron australianum* (F.Muell.) Seem., *J. Bot.* 3: 201 (1865); *Kissodendron australianum* (F.Muell.) Seem. var. *australianum*, F.Muell., *Descr. Notes Papuan Pl.* 5: 88 (1877). **Type:** Queensland. Rockingham Bay, 1 March 1864, *J. Dallachy s.n.* (lecto: MEL 1533942 [here designated]; isolecto: BM 000810429; BR 563082; MEL 1533941).

Kissodendron australianum var. *furfuraceum* C.T.White, *Contr. Arnold Arbor.* 4: 83 (1933). **Type:** Queensland. Cook District: Boonjie, 8 October 1929, *S.F. Kajewski 1256* (holo: BRI).

***Illustrations*:** Elliot & Jones (1997: 418); Cooper & Cooper (2004: 65); Hyland *et al.* (2010).

***Additional selected specimens examined*:** Queensland. Cook District: Mossman River, Feb 1932, *Brass 2145* (BRI); SF 310 Gadgarra, Nov 1995, *Forster PIF17970 & Spokes* (BRI, MEL). North Kennedy District: Kirrama Range, Bryce Henry LA, SF 344, Nov 1992, *Fell DF2041* (BRI, CNS, MEL). South Kennedy District: Clarke Range, Eungella NP, Broken River, near bridge on road to Eungella Dam, Apr 1981, *Telford 11182 & Rudd* (BRI, CANB, NSW). Port Curtis District: Waterpark Creek, Byfield, 1983, *McCabe s.n.* (BRI [AQ394772]). Moreton District: Yandina Creek, SF 351 near Eumundi, Oct 1993, *Bean 6813* (BRI).

***Distribution and habitat*:** *Polyscias australiana* is endemic to Queensland. It is mainly distributed in the Wet Tropics bioregion, but extending further south, *viz.* in the Proserpine – Mackay region, the Byfield area near Rockhampton, and in a very limited area near Eumundi, north of Brisbane (**Map 1**). It grows in evergreen notophyll rainforest where rainfall exceeds 1500 mm per annum. In southern and central Queensland, it is found mainly at low altitudes, but at the northern end of its range, it extends to 1200 metres.

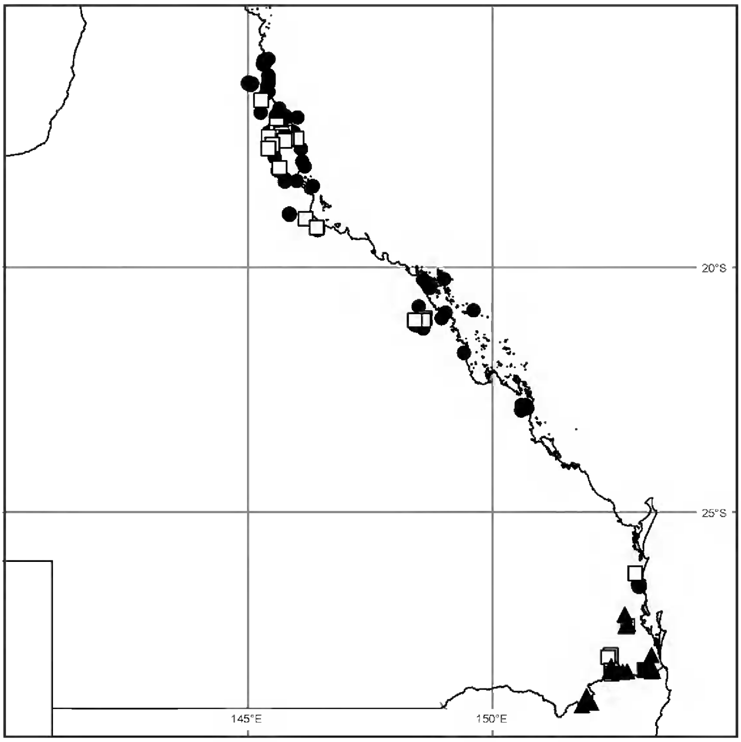
***Notes*:** *Polycias australiana* is distinguished by the pinnate leaves with 7–21 leaflets; the rusty hairs on the developing inflorescences, vegetative shoots and petiole bases; and the primary inflorescence axis bearing many secondary axes in 3 or 4 verticils.

2. Polyscias bellendenkerensis (F.M.Bailey) Philipson, *Austrobaileya* 1: 24 (1977); *Pentapanax bellendenkerensis* F.M.Bailey, *Queensland Agric. J.* 15: 491–492 (1904); *Kissodendron bellendenkerense* (F.M.Bailey) Domin, *Biblioth. Bot.* 89: 484 (1928). **Type:** Queensland. Cook District: Summit of Bellenden-Ker, 20–23 July 1904, *A. Meston 170* (holo: BRI).

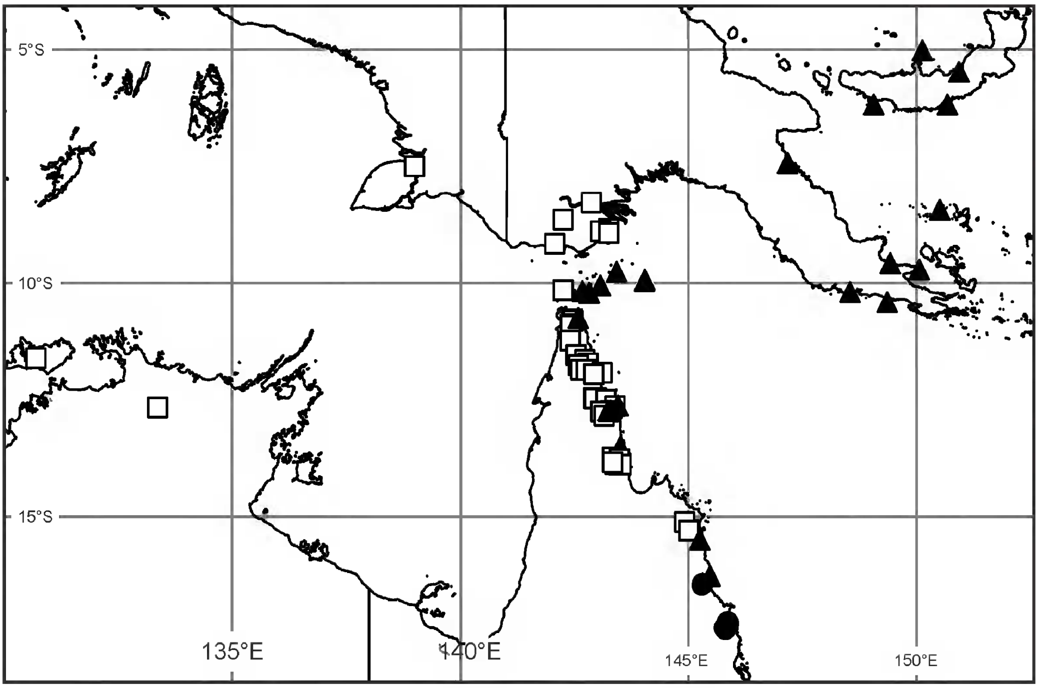
***Illustrations*:** Elliot & Jones (1997: 418); Cooper & Cooper (2004: 65); Hyland *et al.* (2010).

***Additional selected specimens examined*:** Queensland. Cook District: Upper catchment of Mossman River, Mossman Bluff, Jan 1989, *Fell & Baird s.n.* (BRI [AQ457118]); 'Heathland' near helicopter pad on W slope of S peak of Bartle Frere, Wooroonooran NP, Apr 1995, *Hunter JH766* (BRI); Summit of Centre peak, Bellenden Ker, Nov 1972, *Webb & Tracey 11914* (BRI, CANB).

***Distribution and habitat*:** *Polyscias bellendenkerensis* is endemic to Queensland where it is found in two disjunct areas of the Wet Tropics bioregion; on the Mt Bellenden-Ker and Mt Bartle Frere massif, and in the mountains west of Mossman (**Map 2**). It grows in shrubland or elfin 'cloud forest' at altitudes of 1100–1600 metres.



Map 1. Queensland distribution of *Polyscias australiana* ●, *P. murrayi* □, *P. sambucifolia* ▲.



Map 2. Australian and Malesian distribution of *Polyscias bellendenkerensis* ●, *P. macgillivrayi* ▲, *P. zippeliana* □.

Notes: *Polyscias bellendenkerensis* is distinguished by the mostly bipinnate foliage, the flowers borne in umbels, and the styles remaining erect in fruit.

3. Polyscias elegans (C.Moore & F.Muell.) Harms, *Natur. Pflanzen.* III, 8 (111): 45 (1894); *Panax elegans* C.Moore & F.Muell., *Trans. Philos. Inst. Victoria* 2: 68 (1857); *Nothopanax elegans* (C.Moore & F.Muell.) Seem., *Fl. Vit. [Seemann]* 3: 114 (1866); *Tieghemopanax elegans* (C.Moore & F.Muell.) R.Vig., *Bull. Soc. Bot. France* 52: 308 (1905); *Gelibia elegans* (C.Moore & F.Muell.) Hutch., *Gen. Fl. Pl.* 2: 58 (1967). **Type:** Queensland. Moreton Bay, [December 1856], *W. Hill & F. Mueller* (lecto: MEL 672695 [here designated]).

Panax polybotryus F.Muell., *Hooker's J. Bot. Kew Gard. Misc.* 9: 229 (1857). **Type:** Queensland. Moreton Bay, [in 1856] *F. Mueller s.n.* (syn: BM 000810430).

Polyscias branderhorstii Harms, *Nova Guinea* 8: 274 (1909); *Gelibia branderhorstii* (Harms) Hutch., *Gen. Fl. Pl.* 2: 58 (1967). **Type:** New Guinea. South coast at Dorf Gelieb, 3 November 1907, *B. Branderhorst 208* (syn: K 000792854 & K 000792853).

Illustrations: Cooper & Cooper (2004: 65); Hyland *et al.* (2010); Nicholson & Nicholson (2007a: 52).

Additional selected specimens examined: Queensland. Cook District: Thursday Island, Jul 1975, *Stocker 1295* (BRI); The Big Scrub, 2–4 km NE of Mt Surprise turnoff, Mt Garnet – Charters Towers Road, May 1976, *Rodd 3200* (BRI, NSW). South Kennedy District: Carlisle Island, *c.* 1 km W of Turtle Bay and *c.* 35 km N of Mackay, Sep 1986, *Sharpe 4442 & Batianoff* (BRI). Port Curtis District: Stevens Road, S of Pine Mountain, Shoalwater Bay Training Area, Apr 2011, *Bean 30856 & Halford* (BM, BRI, MO). Burnett District: Mt Wooroolin, 4 km WNW of Kingaroy, Apr 1991, *Telford 11036 & Rudd* (BISH, BRI, CANB, NSW). Wide Bay District: Gheerulla Creek, above the falls, W of Mapleton, Apr 1998, *Bean 13199* (BRI). Moreton District: Ithaca Creek, Apr 1876, *Bailey s.n.* (BRI [AQ215503]).

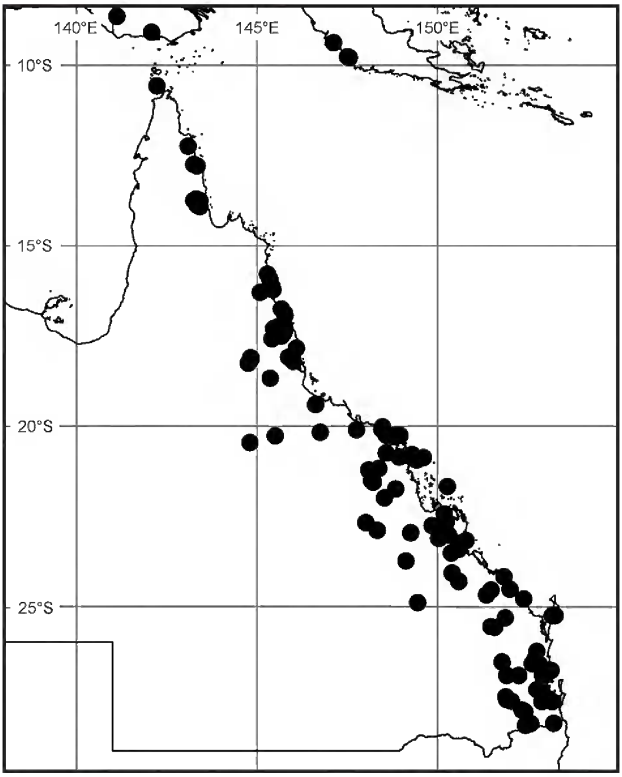
Distribution and habitat: *Polyscias elegans* occurs along the Queensland coast, and extends up to 250 km inland where suitable sheltered habitats exist. It is also found on the Torres Strait islands, and in southern New Guinea (**Map 3**). It also occurs in coastal New South Wales, as far south as Jervis Bay (Floyd 1989). It grows in all types of notophyll rainforest, including those of the littoral zone.

Notes: *Panax polybotryus* was omitted from Govaerts *et al.* (2014), and is treated as a name of uncertain application in APC (2015). In the protologue for *P. polybotryus*, Mueller stated that it has a "racemose, not umbellate inflorescence". *Polyscias elegans* is the only Australian *Polyscias* species that does not have an umbellate inflorescence, a clear indication that the two names are synonymous. This has been confirmed by examination of an image of a type of *P. polybotryus* held at BM. It comprises detached leaflets and a short portion of an infructescence. Both the leaflets and the infructescence are consistent with the species known as *Polyscias elegans.*

Harms (1909) distinguished *Polyscias branderhorstii* from *P. elegans* by the very short pedicels of the fruits and the much "weaker" (sparser?) hairs on the inflorescence. However, these differences are not significant; pedicel length is variable in *P. elegans* throughout its range, as is the density of the inflorescence indumentum.

Nomenclature: *Panax polybotryus* was published in the 9th volume of *Hooker's Journal of Botany and Kew Miscellany*, and p. 229 was published during August 1857 (Stafleu & Cowan 1979). *Panax elegans* was published in the 2nd volume of the *Transactions of the Philosophical Institute of Victoria*, on 30 September 1857 (Chapman 1991); hence in the genus *Panax*, the epithet *polybotryus* has nomenclatural priority over *elegans*. However, *Panax polybotryus* cannot be transferred to *Polyscias*, as the combination *Polyscias polybotrya* is preoccupied for another taxon (*Polyscias polybotrya* Harms, *Notizbl. Königl. Bot. Gart. Berlin 3: 20* (1902)). Therefore *Polyscias elegans* is the correct name for this species.

4. Polyscias macgillivrayi (Seem.) Harms, *Natur. Pflanzen.* III, 8 (111): 45 (1894); *Nothopanax macgillivrayi* Seem., *Fl. Vit. [Seemann]* 3: 114 (1866); *Panax macgillivrayi* (Seem.) Benth., *Fl. Austral.* 3: 382 (1867); *Tieghemopanax macgillivrayi* (Seem.) R.Vig.,



Map 3. Queensland and New Guinea distribution of *Polyscias elegans*.

Bull. Soc. Bot. France 52: 313 (1905). **Type:** Queensland. Cook District: Cape York, October 1848, *J. MacGillivray 431* (lecto: K000792847, here chosen; isolecto: BRI (fragment)).

***Illustrations*:** Hyland *et al.* (2010).

***Additional selected specimens examined*:** Queensland. Cook District: Mount Cook NP, NP 142, 1.5 km WSW of Mt Cook summit, Feb 1993, *Fell DGF2877 & Stanton* (BRI, CNS); Turrel Hill, 10 km WSW of Nesbit River mouth, 51.6 km N of Silver Plains HS, Aug 1993, *Fell DGF3393 et al.* (BRI, CNS); Lamond Hill, Iron Range, Jul 1991, *Forster PIF9016* (BRI); Great Barrier Reef, Restoration Rock, near Cape Weymouth, Portland Roads, Jul 1969, *Heatwole s.n.* (BRI [AQ8116]); Warraber Island, Torres Strait, May 2002, *Waterhouse BMW6410* (BRI, CANB).

***Distribution and habitat*:** *Polyscias macgillivrayi* is found along the east coast of Cape York Peninsula, Queensland, and in coastal parts of mainland Papua New Guinea and New Britain (**Map 2**). It also extends to Micronesia (Philipson 1979). It mainly inhabits the littoral zone almost exclusively, and is frequent on continental islands, but occasionally extends up to 20 km inland.

***Notes*:** Dried specimens of this species are instantly discernible by their strong odour resembling curry powder.

5. Polyscias mollis (Benth.) Harms, *Natur. Pflanzen.* III, 8 (111): 45 (1894); *Panax mollis* Benth., *Fl. Austral.* 3: 382 (1867); *Nothopanax mollis* (Benth.) Seem., *J. Bot.* 4: 295 (1866); *Tieghemopanax mollis* (Benth.) R.Vig., *Bull. Soc. Bot. France* 52: 312 (1905). **Type:** Queensland. Rockingham Bay, undated, *J. Dallachy s.n.* (lecto: MEL 2249865 [here designated]; isolecto: MEL 2249866; MEL 2249858).

Panax macdowallii F.Muell., *Southern Science Record n.s.* 2 (1886); *Aralia macdowallii* (F.Muell.) F.Muell. ex F.M.Bailey, *Syn. Queensland Fl. Suppl.* 2: 31 (1888); *Polyscias macdowallii* (F.Muell.) Domin, *Biblioth. Bot.*

89: 485 (1928). **Type:** Queensland. "Russell's River, Walter Hill", *n.v.*

Illustrations: Cooper & Cooper (2004: 65); Hyland *et al.* (2010).

***Additional selected specimens examined*:** Queensland. Cook District: Palmerston NP, west of Crawford Lookout, Jan 1993, *Bean 5407* (BRI); Westcott Road, Topaz, Mar 2001, *Cooper 1522 & Cooper* (BRI); trail into Stockwellia site near Malanda, Feb 2009, *Costion 1695* (BRI, CNS); Wooroonooran NP, Ghourka Road, Mar 2003, *Forster PIF29260 & Cooper* (BRI, MEL); SFR 755, North Johstone LA, Mar 1976, *Moriarty 1966* (BRI, CNS); Bailey's Creek area, Oct 1963, *Smith 11654* (BRI).

***Distribution and habitat*:** *Polyscias mollis* is endemic to Queensland, and confined to the Wet Tropics bioregion, from Innisfail to Cooktown (**Map 4**), where it grows as an understorey species in complex notophyll rainforest in high rainfall areas.

***Notes*:** *Polyscias mollis* is unique among Australian *Polyscias* species by virtue of its prickly stems. The leaf rachis is sometimes prickly as well. The tiny marginal teeth on the leaflets are also diagnostic. The typical form has numerous short erect hairs on the leaflets, rachises and inflorescences. A glabrous form that was described at species rank (*Panax macdowallii* F.Muell.), is apparently common, and perhaps as widely distributed as the typical form. Govaerts *et al.* (2014) accepted *Polyscias macdowallii* as a distinct species, but apart from the indumentum, it does not differ in any consistent way from *P. mollis sens str.*

***Typification*:** There are six sheets at MEL of *Polyscias mollis* material that were collected by Dallachy from Rockingham Bay. MEL 2249865 is here chosen as the lectotype as the material on the sheet is a good match for the protologue, and the corner of the label has a "B" indicating that it was seen by Bentham for *Flora Australiensis.* One of the sheets (MEL 2249857) was certainly not seen by Bentham as its label includes information about the prickly stems possessed by the species, and that information is missing from the protologue; another sheet (MEL 2249859) is probably not original material as it bears mature fruits, and the protologue stated that fruits were "not seen quite ripe"; another sheet (MEL 2271939) bearing only leaflets, is perhaps a part of the same gathering as MEL 2249857, and if so, it is not original material.

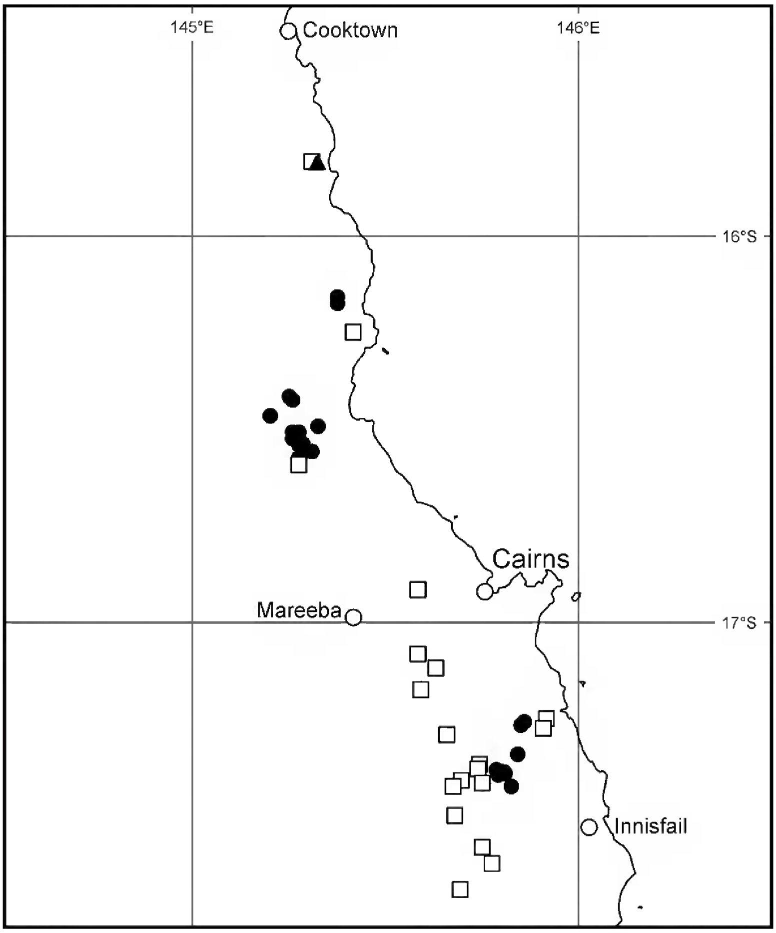
The type of *Panax macdowallii* is not present at MEL, where one would expect it to be (W. Gebert pers. comm. Sep 2014). Bailey (1888) cited Mueller as saying that he had recently received "further specimens collected by Mr Sayer" soon after his original naming. There are numerous Araliaceae specimens at MEL collected by Sayer, but the only one matching the protologue (i.e. having 2 styles and pinnate leaves) is MEL 2249860. This scrappy specimen is quite glabrous, and some prickles are present on the very short section of stem that has been preserved, and the leaflets have tiny marginal teeth, confirming it as the glabrous form of *P. mollis.* Since Mueller considered the Sayer specimen to be the same taxon as his *Panax macdowallii*, it follows that *P. macdowallii* is the glabrous form of *P. mollis.*

6. Polyscias murrayi (F.Muell.) Harms, *Natur. Pflanzen.* III, 8 (111): 45 (1894); *Panax murrayi* F.Muell., *Fragm.* 2: 106 (1860); *Nothopanax murrayi* (F.Muell.) Seem., *J. Bot.* 4: 295 (1866); *Tieghemopanax murrayi* (F.Muell.) R.Vig., *Bull. Soc. Bot. France* 52: 310 (1905). **Type:** New South Wales. Near Twofold Bay, [September 1860], *F. Mueller s.n.* (lecto: MEL 672694 [here designated]; isolecto: BM 000810432; BR 563113; MEL 672693; MEL 672754).

***Illustrations*:** Cooper & Cooper (2004: 66); Hyland *et al.* (2010); Nicholson & Nicholson (2007b: 48).

***Additional selected specimens examined*:** Queensland. Cook District: Mt Haig, Emerald LA, Aug 1976, *Stocker 1527* (BRI). North Kennedy District: Bluewater SF, NW of Townsville, Oct 1992, *Bean 5071* (BRI, MEL). South Kennedy District: 500 m along walking track to Mt Dalrymple, Eungella NP, Jul 1995, *Wiecek 594 et al.* (BRI, CANB, MEL, NSW, SYD). Darling Downs District: W of Moss Gardens, near Killarney, Mar 2004, *Bean 21775* (BRI). Moreton District: The Summit, Mt Glorious, Mar 1999, *Phillips 198* (BRI).

***Distribution and habitat*:** In Queensland, *Polyscias murrayi* occurs mainly in the south-east of the state, but with disjunct occurrences



Map 4. Australian distribution of *Polyscias mollis* □, *P. spectabilis* ▲, *P. willmottii* ●.

around Eungella, west of Mackay, and in the Wet Tropics where it is found as far north as Mt Lewis, near Julatten (**Map 1**). It occurs all along the New South Wales coast and just into Victoria (Floyd 1989). It is a pioneer species, inhabiting roadsides and sunny breaks in notophyll rainforest. In Queensland it is rarely found below 500 metres in altitude.

***Notes*:** The leaflet margins are usually distinctly toothed, but in some collections, the leaflets are entire.

7. Polyscias nodosa (Blume) Seem., *J. Bot.* 3: 181 (1865); *Aralia nodosa* Blume, *Bijdr. Fl. Ned. Ind.* 873 (1826); *Paratropia nodosa* (Blume) DC., *Prodr.* 4: 265 (1830); *Hedera nodosa* (Blume) Hassk., *Tijdschr. Natuurl. Gesch. Physiol.* 10: 131 (1843); *Eupteron nodosum* (Blume) Miq., *Bonplandia* 4: 139 (1856). **Type:** Indonesia. Mt Menara, Java, *s.dat.*, *s.coll.* (lecto: L 0008479 [here designated]).

***Illustrations*:** Cooper & Cooper (2004: 66); Hyland *et al.* (2010).

***Additional selected specimens examined*:** Queensland. Cook District: Iron Range NP, Gordon Creek, Sep 1997, *Gray 7248* (BRI, CNS); Kuranda Range Road, Sep 1987, *Gray 4567* (BRI, CNS); Foot of MacAlister Range, 2.5 km ENE of Saddle Mountain, Oct 1987, *Lyons 49* (BRI, DNA); Base of Mt Isley, Edmonton, S of Cairns, Jan 1997, *Plunkett 1537 et al.* (BRI); Bank of Barratt

Creek, Oct 1992, *Russell s.n.* (BRI [AQ547505]). North Kennedy District: Brandy Creek Road, about 5 km E of Shute Harbour and 13 km NE of Proserpine, Nov 1985, *Sharpe 4149* (BRI).

***Distribution and habitat*:** In Queensland *Polyscias nodosa* is known from Iron Range; at several locations between Cooktown and Tully; and in a limited area near Proserpine (**Map 5**). It also occurs in mainland Papua New Guinea, Bougainville, Java, Lombok, Celebes, Moluccas and the Philippines (Philipson 1979). It is a pioneer species that inhabits disturbed sites in evergreen notophyll rainforest in high rainfall areas.

***Notes*:** Fertile specimens are easily recognisable by their long racemose inflorescences bearing sessile umbels. The leaves may exceed two metres in length. It is cultivated as an ornamental in south-east Asia.

8. Polyscias pupurea C.T.White, *Proc. Roy. Soc. Queensland* 47: 64 (1936), as *Polyscias purpureus*. **Type:** Queensland. Cook District: Mossman River Gorge, 5 February 1932, *L.J. Brass 2072* (holo: BRI; iso: MEL).

***Illustrations*:** Cooper & Cooper (2004: 66); Hyland *et al*. (2010).

***Additional selected specimens examined*:** Queensland. Cook District: Rex Range, NE of Julatten, Jan 1993, *Bean 5676 & Forster* (BRI, DNA); Mt Bartle Frere, Jun 1986, *Bruhl 534* (BRI, CANB); FR 310, Swipers LA, E of Malanda, Aug 1963, *Hyland AFO/2752* (BRI, CNS); McIlwraith Range, Sep 1974, *Hyland 7638* (BRI, CNS); *c.* 0.5 km south of Copperlode Falls Dam, Mar 2009, *Jago 7256* (BRI, L); Gold Hill summit ridge, TR 165, Aug 1986, *Weston 474 et al.* (BRI, CNS, NSW); Kuranda, Feb 1922, *White 1532* (BRI).

***Distribution and habitat*:** *Polyscias purpurea* is endemic to Queensland where it occurs in the McIlwraith Range, and in the Wet Tropics bioregion of Queensland, between Cooktown and Tully (**Map 5**). It is an understorey species in evergreen notophyll rainforest in high rainfall areas.

***Notes*:** It can be distinguished by its complete lack of hairs on all plant parts, and the purple petals.

9. Polyscias sambucifolia (DC.) Harms, *Natur. Pflanzen.* III, 8 (111): 45 (1894); *Panax sambucifolius* DC., *Prodr.* 4: 255 (1830); *Nothopanax sambucifolia* (DC.) K.Koch, *Wochenschr. Gartnerei Pflanzenk.* 2: 77 (1859); *Tieghemopanax sambucifolius* (DC.) R.Vig., *Bull. Soc. Bot. France* 52: 310 (1905). **Types:** New Holland, [in 1823], *F.W. Sieber Fl. Nov. Holl.* n. 256 (syn: BM 000810433; syn: BR 563114; syn: G-DC, microfiche!; syn: M 0172422; syn: M 0172423).

***Additional selected specimens examined*:** Queensland. Moreton District: Near White Swamp road, SSW of Boonah, Feb 1990, *Bean 1365* (BRI, CANB); 6 km W of Mt Glorious, Dec 1995, *Bean 9370* (BRI, NSW); 7 km NW of Springbrook on Ankida Nature Refuge, Jan 2005, *Thompson MOR543* (BRI). Darling Downs District: 1.5 km S of Christie Target, near Wallangarra, Dec 1989, *Bean 1216* (BRI, NSW); South Bald Rock Swamp, E side near South Bald Rock, Girraween NP, Feb 1994, *Grimshaw G422 & Robins* (BRI).

***Distribution and habitat*:** In Queensland *Polyscias sambucifolia* is confined to the south-east corner, south from Mt Mee, above 400 m altitude (**Map 1**). It is widespread in New South Wales, Victoria and Tasmania. It inhabits simple rainforest or wet sclerophyll eucalypt forest on a variety of soil types.

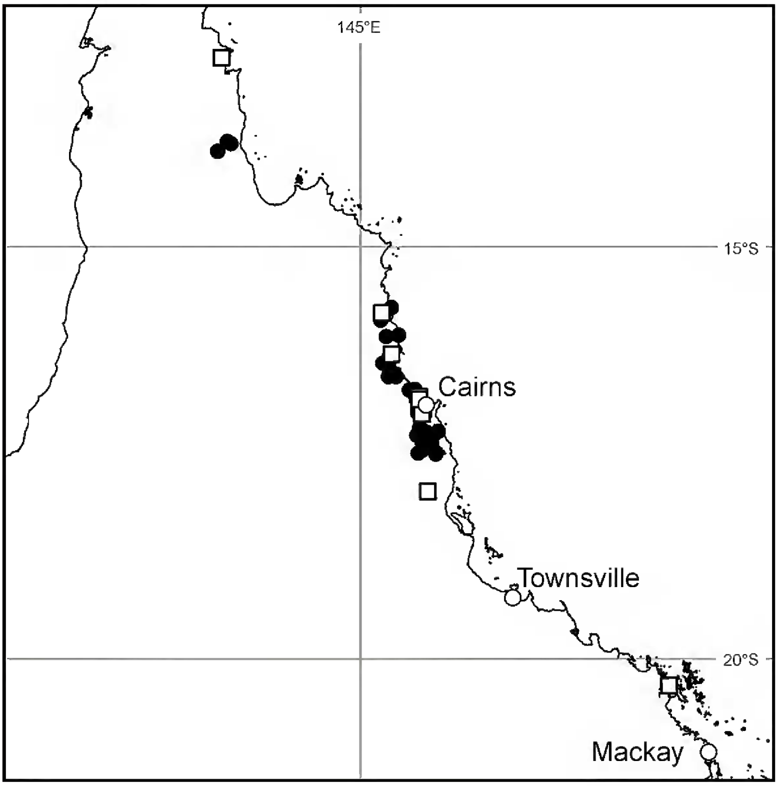
***Notes*:** *Polyscias sambucifolia* is a highly variable species for which a number of putative subspecies have been proposed (APNI 2015). None of these occur in Queensland where the species has relatively uniform morphology.

10. Polyscias spectabilis (Harms) Lowry & G.M.Plunkett, *Pl. Divers. Evol.* 128: 74 (2010); *Peekeliopanax spectabilis* Harms, *Notizbl. Bot. Gart. Berlin-Dahlem* 9: 478 (1926); *Gastonia spectabilis* (Harms) Philipson, *Blumea* 18: 494 (1970). **Type:** Papua New Guinea. New Ireland Province: Lamekot, Lamusong, in 1925, *G. Peekel 1001* (holo: B, destroyed; iso: ?, n.v.).

***Illustrations*:** Cooper & Cooper (2004: 64); Hyland *et al*. (2010), as *Gastonia spectabilis*.

***Selected specimen examined*:** Queensland. Cook District: Cedar Bay NP, Gap Creek area, Jun 2005, *Forster PIF31018 & Jensen* (BRI, L, MEL, NSW).

***Distribution and habitat*:** In Australia, *Polyscias spectabilis* is confined to a single locality in the Gap Creek area near Bloomfield, Queensland (**Map 4**). It is however, widespread in New Guinea and adjacent islands (Philipson 1979). It is a



Map 5. Australian distribution of *Polyscias nodosa* □, *P. purpurea* ●.

pioneer species that inhabits disturbed sites in evergreen notophyll rainforest in high rainfall areas.

***Notes*:** This species reportedly reaches 30 metres in height in Australia, and 40 metres in New Guinea. Philipson (1979) conjectured that it is "possibly the largest araliad known".

11. Polyscias willmottii (F.Muell.) Philipson, *Austrobaileya* 1: 24 (1977); *Pentapanax willmottii* F.Muell., *Austral. J. Pharm.* 2: 125 (1887). **Type:** Queensland. Cook District: Mt Bellenden-Ker, in 1887, *W.A. Sayer & A. Davidson 34* (lecto: MEL 672698 [here designated]; isolecto: MEL 672699).

***Illustrations*:** Cooper & Cooper (2004: 66); Hyland *et al.* (2010); Nicholson & Nicholson (2004: 57).

***Additional selected specimens examined*:** Queensland. Cook District: 27.3 km from the Rex Highway on Mt Lewis Road near Julatten, Nov 1990, *Holland 36* (BRI, NSW); Black Snake Lookout, Wooroonooran NP, Jul 1995, *Hunter JH4624* (BRI); Boulder field, 50 m north of Bower Bird site, just past NW Peak, Bartle Frere, May 2004, *Jensen 1397* (BRI, MEL); summit of Mt Lewis, Nov 1988, *Jessup GJM5134 et al.* (BRI, DNA, NSW); North Mary LA, SF 143, Jul 1994, *Forster PIF15624* (BRI, CNS, MEL, NSW).

***Distribution and habitat*:** *Polyscias willmottii* is endemic to Queensland, and confined to the Wet Tropics bioregion between Mt Bartle Frere and Thornton Peak (**Map 4**). It grows in high-altitude rainforest or 'cloud forest', between 1000–1600 metres.

***Notes*:** *Polyscias willmottii* is distinguished by the glabrous new-growth, the wavy leaflet margins, the relatively long petiolules and the 5-locular fruits.

12. Polyscias zippeliana (Miq.) Valeton, *Bull. Dép. Agric. Indes Néerl.* 10: 42 (1907); *Panax zippelianum* Miq., *Ann. Mus. Bot. Lugduno-Batavi* 1: 15 (1863); *Nothopanax zippelianus (Miq.) Seem., Fl. Vit. [Seemann]* 115 (1866). **Type:** Indonesia. Papua. Near Dourga River, [May 1828], *A. Zippelius* (lecto: L 0008487, [here designated]; isolecto: K 000792850, L 0008488).

Kissodendron australianum var. *dispermum* F.Muell., *Descr. Notes Papuan Pl.* 5: 88 (1877); *Kissodendron dispermum* (F.Muell.) Domin, *Biblioth. Bot.* 89: 484 (1928); *Polyscias australiana* var. *disperma* (F.Muell.) Philipson, *Blumea* 24: 171 (1978); *Polyscias disperma* (F.Muell.) Lowry & Plunkett, *Pl. Divers. Evol.* 128: 68 (2010), *nom. illeg. non* Blanco (1837), ***syn. nov.*** **Type:** Papua New Guinea. Fly River, [December 1875], *L.M. d'Albertis s.n.* (syn: MEL, image!; syn: FI [Beccari Herbarium 4662], image!).

***Additional selected specimens examined*: Queensland.** Cook District: Lockerbie, 10 miles [16 km] WSW of Somerset, Apr 1948, *Brass 18412* (A, BRI); 22.6 km E of Bromley on the track to Carron Valley, Jul 1990, *Clarkson 8878 & Neldner* (BRI, CNS); Head of Pascoe River, 5 km NW of Mt Yangee, 21.2 km WSW of Lockhart River community, Apr 1994, *Fell DGF4274 & Claudie* (BRI, DNA); 3.5 km NNE of Massy Creek Crossing, Silver Plains Station, eastern fall of McIlwraith Range, Jul 1993, *Forster PIF13611 et al.* (BRI, MEL); Richardson Range, 18 km along Middle Peak track to Shelburne Bay, Jun 2008, *Forster PIF33617 & McDonald* (BRI, PE); Bamaga, Cape York, Sep 1963, *Jones 2516* (BRI, CANB); N of Massy Creek, *c.* 13 km NW of Silver Plains, Aug 1978, *Kanis 2019* (BRI, CANB, L); McIlwraith Range (NP proposal), Sep 2004, *McDonald KRM3019* (BRI, DNA); Isabella Falls, off Cooktown – Laura road, *c.* 30 km from Cooktown, Jan 1997, *Plunkett 1550 et al.* (BRI); Isabella Falls, on the Battle Camp road, 31.6 km NW of Cooktown, Nov 2010, *Wilson 685 & Wilson* (BRI, CANB, CNS).

***Distribution and habitat*:** *Polyscias zippeliana* is widespread in far north Queensland on Cape York Peninsula and the islands of Torres Strait. It is also common in the lowlands of southern New Guinea, both in Papua New Guinea and Indonesian Papua, and is found in the far north of the Northern Territory, including Melville Island and Kakadu NP (**Map 2**). It typically grows along watercourses with fringing rainforest in a landscape dominated by *Eucalyptus* and *Melaleuca* woodland.

***Notes*:** *Polyscias zippeliana* is clearly allied to *P. australiana*, but differing by the larger often 2-locular fruits and longer pedicels, by the primary inflorescence axis lacking the 3 or 4 many-branched verticils, and the generally fewer leaflets.

Polyscias zippeliana has previously been recorded as occurring in Australia, without any precise location or specimen citations, by Philipson (1995) and Lowry & Plunkett (2010). Despite this, it was not recorded for Queensland in Bostock & Holland (2014) or for Australia in AVH (2015). The record of *P. australiana* from Northern Territory (Short *et al*. 2011) is referable to *P. zippeliana*.

Philipson (1995) described *P. zippeliana* as having "3 or 4 pairs of leaflets", mimicking the description in the protologue. However, it is unrealistic to suppose that there could be so little variation in the number of leaflets in this species, when every other species has a considerable range of leaflet numbers.

Philipson (1995) also stated that the New Guinean species *Polyscias schultzei* Harms occurs in "Queensland, Australia". As Philipson restricted his view of *P. zippeliana* to specimens bearing 3 or 4 pairs of leaflets, it seems likely that Australian specimens of *P. schultzei sensu* Philipson are in fact *P. zippeliana* with 5 or more pairs of leaflets. It is also quite possible that *P. schultzei* is synonymous with *P. zippeliana*, but that determination requires further study.

Key to the *Polyscias* species of Queensland

1 At least some bipinnate leaves on a given branch **2**
1. All leaves pinnate **3**

2 Leaflets elliptical, 2.3–3.5 times longer than wide; flowers in umbels; styles not recurved in fruit. . . . . **2. P. bellendenkerensis**

2. Leaflets broadly ovate, 1.6–2.3 times longer than wide; flowers solitary, arranged in a raceme along the secondary axes; styles recurved in fruit. . . . . **3. P. elegans**

3 Stems with stout prickles; leaflet margins with many small teeth 0.3–0.5 mm long. . . . . **5. P. mollis**
3. Stems unarmed; leaflet margins entire or with teeth *c.* 1 mm long **4**

4 Undersides of mature leaflets white or grey due to very numerous tiny peltate scales . . . . **9. P. sambucifolia**
4. Undersides of mature leaflets green, glabrous **5**

5 New vegetative growth, petiole bases and floral bracts hairy **6**
5. New vegetative growth, petiole bases and floral bracts glabrous. **8**

6 Petiolules of lateral leaflets < 5% lamina length; fruits 10-locular; styles recurved in fruit; the hairs white or grey; pedicels not articulated . . . **10. P. spectabilis**
6. Petiolules of lateral leaflets 5–20% of lamina length; fruits 2- or 3-locular; styles erect in fruit; the hairs rusty-coloured; pedicels articulated **7**

7 Dried fruits 3.5–6 mm long, 3 or 4-locular; fruiting pedicels 3–9 mm long . . . . **1. P. australiana**
7. Dried fruits 6.5–8 mm long, 2 or 3 (–4)-locular; fruiting pedicels 13–23 mm long . . . . **12. P. zippeliana**

8 Tall trees, often exceeding 15 m; well-developed leaves more than 1.5 m long, leaflets 15–35; petiolules of lateral leaflets < 5% of lamina length **9**
8. Small trees to 6 m high; well-developed leaves 20–50 cm long, leaflets 3–15; petiolules of lateral leaflets 5–45% of lamina length **10**

9 Leaflets narrow, 3.2–5 times longer than wide; fruits 2-locular, flattened, distinctly pedicellate . . . . **6. P. murrayi**
9. Leaflets broader, 2.1–2.8 times longer than wide; fruits 5-locular, ± globose, sessile . . . . **7. P. nodosa**

10 Petiolules long, 25–45% of leaflet length; leaflet margins undulate; fruits 5-locular . . . . **11. P. willmottii**
10. Petiolules shorter, 5–20% of leaflet length; leaflet margins flat; fruits 2-locular. **11**

11 Leaflets ± parallel-sided, abruptly narrowed near apex; dried specimens highly odoriferous; petals white to greenish; dried mature fruits 4–5 mm long, fruiting pedicels 3.5–5 mm long; usually growing in littoral zone . . . . **4. P. macgillivrayi**
11. Leaflets tapering ± evenly to the apex; dried specimens not odoriferous; petals purple; dried mature fruits 2.5–3.5 mm long, fruiting pedicels 1.5–3 mm long; growing in rainforest away from the coast. . . . . **8. P. purpurea**

Acknowledgements

I am grateful to Will Smith (BRI) for editing the distribution maps; to the curatorial staff at MEL and particularly Wayne Gebert, for sending images of type specimens at my request; and to Chiara Nepi (FI) for sending an image of a type specimen held there.

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